```
1/1                                                                 32/11
AAC ATG AAC ATC AAA GGA TCG CCA TGG AAA CGG TCC CTC CTG CTG CTG CTG GTG TCA AAC      60
N   M   N   I   K   G   S   P   W   K   G   S   L   L   L   L   L   V   S   N
62/21                                                               92/31
CTG CTG CTG TGC CAG AGC GTG GCC CCC TTG CCC ATC TGT CCC GGC GGG GCT GCC CGA TGC     120
L   L   L   C   Q   S   V   A   P   L   P   I   C   P   G   G   A   A   R   C
122/41                                                              152/51
CAG GTG ACC CTT CGA GAC CTG TTT GAC CGC GCC GTC GTC CTG TCC CAC TAC ATC CAT AAC     180
Q   V   T   L   R   D   L   F   D   R   A   V   V   L   S   H   Y   I   H   N
182/61                                                              212/71
CTC TCC TCA GAA ATG TTC AGC GAA TTC GAT AAA CGG TAT ACC CAT GGC CGC GGG TTC ATT     240
L   S   S   E   M   F   S   E   F   D   K   R   Y   T   H   G   R   G   F   I
242/81                                                              272/91
ACC AAG GCC ATC AAC AGC TGC CAC ACT TCT TCC CTT GCC ACC CCC GAA GAC AAG GAG CAA     300
T   K   A   I   N   S   C   H   T   S   S   L   A   T   P   E   D   K   E   Q
302/101                                                             332/111
GCC CAA CAG ATG AAT CAA AAA GAC TTT CTG AGC CTG ATA GTC AGC ATA TTG CGA TCC TGG     360
A   Q   Q   M   N   Q   K   D   F   L   S   L   I   V   S   I   L   R   S   W
362/121                                                             392/131
AAT GAG CCT CTG TAT CAT CTG GTC ACG GAA GTA CGT GGT ATG CAA GAA GCC CCG GAG GCT     420
N   E   P   L   Y   H   L   V   T   E   V   R   G   M   Q   E   A   P   E   A
422/141                                                             452/151
ATC CTA TCC AAA GCT GTA GAG ATT GAG GAG CAA ACC AAA CGG CTT CTA GAG GGC ATG GAG     480
I   L   S   K   A   V   E   I   E   E   Q   T   K   R   L   L   E   G   M   E
482/161                                                             512/171
CTG ATA GTC AGC CAG GTT CAT CCT GAA ACC AAA GAA AAT GAG ATC TAC CCT GTC TGG TCG     540
L   I   V   S   Q   V   H   P   E   T   K   E   N   E   I   Y   P   V   W   S
542/181                                                             572/191
GGA CTT CCA TCC CTG CAG ATG GCT GAT GAA GAG TCT CGC CTT TCT GCT TAT TAT AAC CTG     600
G   L   P   S   L   Q   M   A   D   E   E   S   R   L   S   A   Y   Y   N   L
602/201                                                             632/211
CTC CAC TGC CTA CGC AGG GAT NNN CAT AAA ATC GAC AAT TAT CTC AAG CTC CTG AAG TGC     660
L   H   C   L   R   R   D   X   H   K   I   D   N   Y   L   K   L   L   K   C
662/221                                                             692/231
CGA ATC ATC CAC AAC AAC AAC TGC TAA GCC CAC ATC CAT TTC ATC TAT TTC TGA GAA GCT     720
R   I   I   H   N   N   N   C   *   A   H   I   H   F   I   Y   F   *   E   Q
722/241                                                             752/251
CCT TAA TGA TCC GTT CCA TTG CAA GCT TCT TTT AGT TGT ATC TCT TTT GAA TCC ATG CTT     780
P   *   *   S   V   P   L   Q   A   S   F   S   C   I   S   F   E   S   M   L
782/261                                                             812/271
GGG TGT AAC AGG TCT CCT CTT AAA AAA TAA AAA CTG ACT CGT TAG AGA CAT C               832
G   C   N   R   S   P   L   K   K   *   K   L   T   R   *   R   H
```

FIG. 1

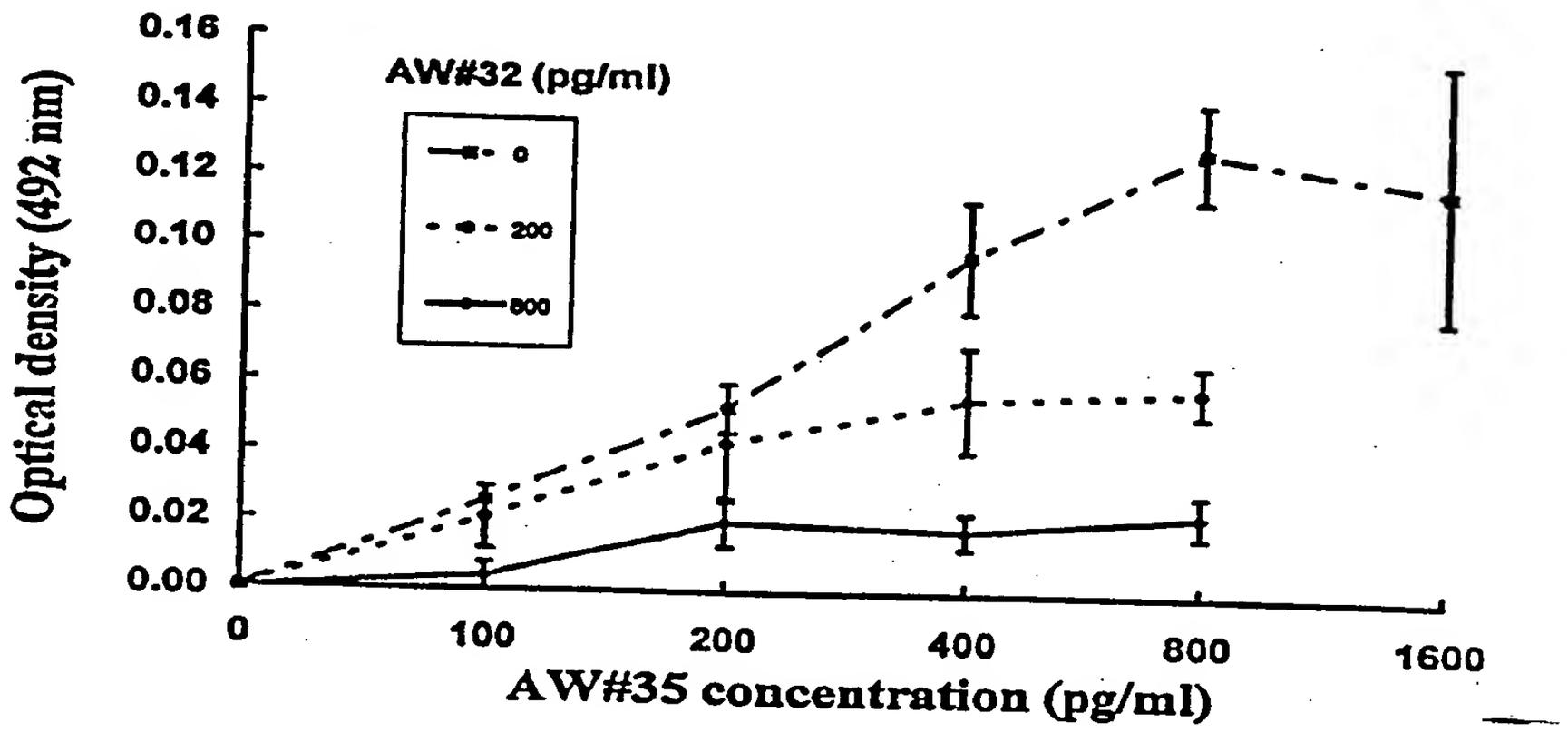
AW#32 (pg/ml)
0
200
800
Optical density (492 nm)
0.16
0.14
0.12
0.10
0.08
0.06
0.04
0.02
0.00
0
100
200
400
800
1600
AW#35 concentration (pg/ml)

FIG. 2

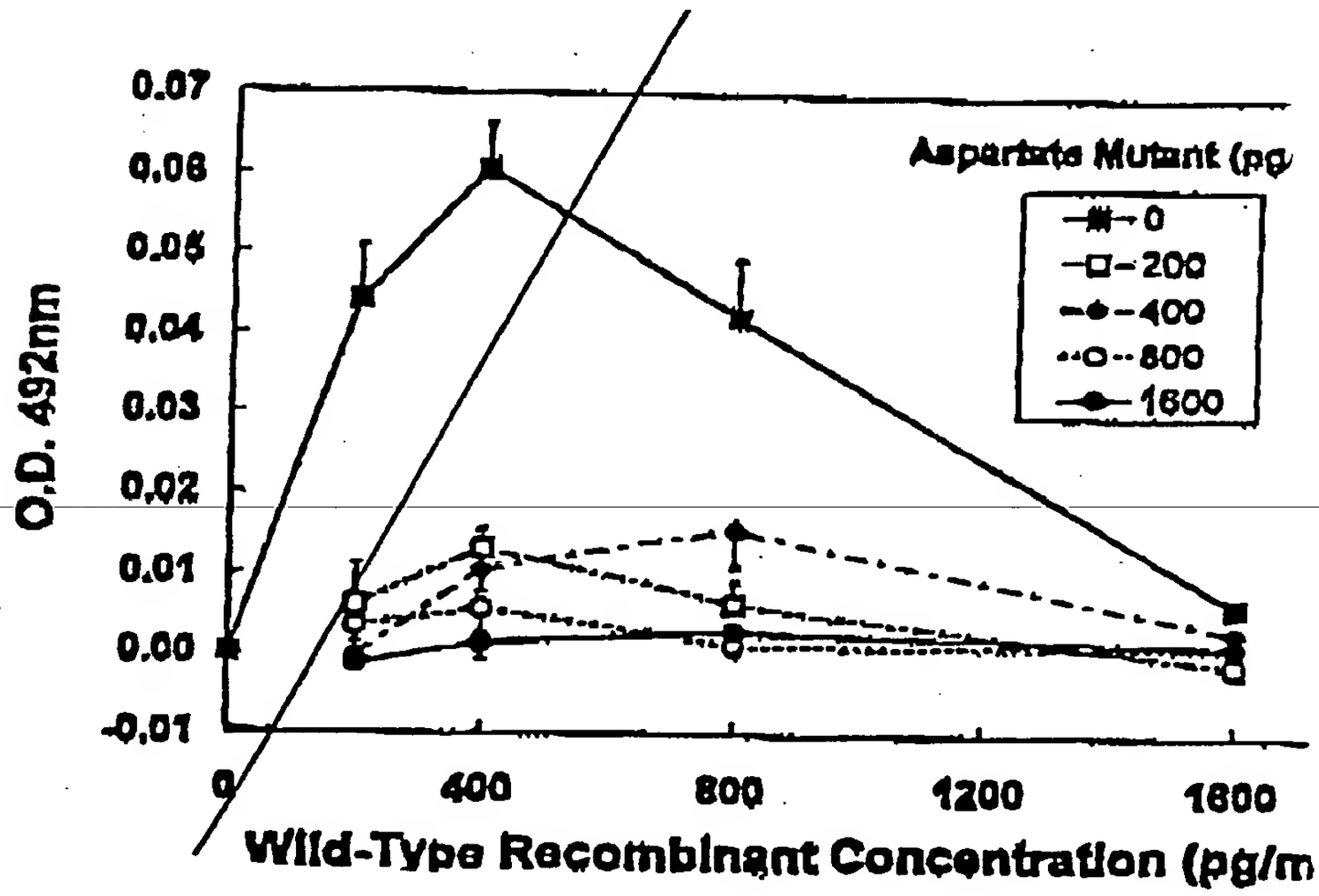
Aspartate Mutant (pg
0
200
400
800
1600
O.D. 492nm
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
-0.01
0
400
800
1200
1600
Wild-Type Recombinant Concentration (pg/m

FIG. 3